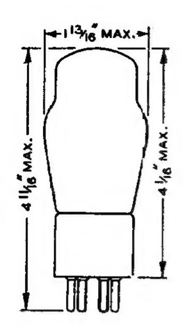


RCA-42

POWER-AMPLIFIER PENTODE

The 42 is a heater-cathode type of power-amplifier pentode for use in the audio-output stage of receivers. It is capable of giving large power output with a relatively small input-signal voltage. Because of the heater-cathode construction, a uniformly low hum-level is attainable in power amplifier design.

CHARACTERISTICS

Heater Voltage (A. C. or D. C.)	6.3	Volts
Heater Current	0.7	Ampere
Bulb		ST-14
Base		Medium 6-Pin

As Single-Tube Class A_1 Amplifier

	Pentode Connection		*Triode Connection Screen tied to plate*	
Plate Voltage	250	315 *max.*	250°	Volts
Screen Voltage (Grid No. 2)	250	315 *max.*	—	Volts
Grid Voltage (Grid No. 1)	–16.5	–22	–20	Volts
Plate Current	34	42	31	Milliamperes
Screen Current	6.5	8	—	Milliamperes
Plate Resistance (Approx.)	80000	100000	2700	Ohms
Amplification Factor (Approx.)	190	260	6.2	
Transconductance	2350	2600	2300	Micromhos
Load Resistance	7000	7000	3000	Ohms
Total Harmonic Distortion	7	7	5	Per cent
Power Output	3	5	0.65	Watts

Under the above maximum voltage conditions, transformer or impedance input-coupling devices are recommended. If resistance coupling is used, refer to last paragraph of APPLICATION under type 6F6.

° Maximum plate volts = 315.

As Push-Pull Class AB_2 Amplifier—Pentode Connection

Values are for two tubes.

	Fixed Bias	*Self-Bias*	
Plate Voltage	375 *max.*	375 *max.*	Volts
Screen Voltage (Grid No. 2)	250 *max.*	250 *max.*	Volts
Grid Voltage (Grid No. 1)	–26 *min.*	—	Volts
Self-Bias Resistor	—	340 *min.*	Ohms
Zero-Signal Plate Current	34	54	Milliamperes
Zero-Signal Screen Current	5	8	Milliamperes
Load Resistance (Plate-to-plate)	10000	10000	Ohms
Total Harmonic Distortion	5	5	Per Cent
Power Output	19*	19‡	Watts

* With one triode-connected 42 as driver operated at plate volts of 250, grid volts of –20, and with a minimum plate load of approximately 10000 ohms: input transformer ratio, primary to one-half secondary, is 3.32. The plate, screen and grid supply have negligible resistance.

‡ With one triode-connected 42 as driver operated at plate volts of 250, grid volts of –20, and with a minimum plate load of approximately 10000 ohms: input transformer ratio, primary to one-half secondary, is 2.5. The plate and screen supply have negligible resistance. The value given for the self-bias resistor is determined for a minimum grid bias of –21 volts.

Under the above maximum voltage conditions, transformer or impedance input-coupling devices must be used.

As Push-Pull Class AB_2 Amplifier—Triode Connection
Screen Tied to Plate

Values are for two tubes.

	Fixed Bias	*Self-Bias*	
PLATE VOLTAGE	350 *max.*	350 *max.*	Volts
GRID VOLTAGE	−38 *min.*	—	Volts
SELF-BIAS RESISTOR	—	730 *min.*	Ohms
ZERO-SIGNAL PLATE CURRENT	45	50	Milliamperes
LOAD RESISTANCE (Plate-to-plate)	6000	10000	Ohms
TOTAL HARMONIC DISTORTION	7	7	Per cent
POWER OUTPUT	18†	14**	Watts

† With one triode-connected 42 as driver operated at plate volts of 250, grid volts of −20, and with a minimum plate load of approximately 10000 ohms: input transformer ratio, primary to one-half secondary, is 1.67. The plate and grid supply have negligible resistance.

** With one triode-connected 42 as driver operated at plate volts of 250, grid volts of −20, and with a minimum plate load of approximately 10000 ohms: input transformer ratio, primary to one-half secondary, is 1.29. The plate supply has negligible resistance. The value given for the self-bias resistor is determined for a minimum grid bias of −36.5 volts.

Under the above maximum voltage conditions, transformer or impedance input-coupling devices must be used

INSTALLATION AND APPLICATION

The **base** pins of the 42 fit the standard six-contact socket which may be installed to hold the tube in any position. Sufficient ventilation should be provided to prevent overheating.

The **heater** is designed to operate at 6.3 volts. In a series-heater circuit employing several 6.3-volt types and one or more 42's, the heaters of the 42's should be placed on the positive side. Furthermore, since most 6.3-volt types have 0.3-ampere heaters, a bleeder circuit across these heaters is required to take care of the additional 0.4-ampere heater current of the 42. Each 6.3-volt tube of the 0.3-ampere type in the series circuit should, therefore, be shunted by a bleeder resistance of 16 ohms.

The **cathode** should preferably be connected directly to a mid-tap on the heater winding or to a center-tapped resistor across the heater winding. If this practice is not followed, the potential difference between heater and cathode should be kept as low as possible.

For **application,** refer to type 6F6.

Additional curve data is given under type 2A5.

